TECHNICAL DESCRIPTION

MODULAR CAR CONCEPT

JUNE 3, 1974

COMMUNITY TRANSPORTATION SERVICES DIVISION
WALT DISNEY PRODUCTIONS

"CTS: THE PEOPLE MOVING PEOPLE"

RESPONSE TO NUMEROUS REQUESTS

Walt Disney Productions established its new division, Community Transportation Services, in February 1974, in response to numerous requests from cities, airports and shoppings centers interested in applications of the company's monorail and WEDway PeopleMover systems. "CTS: THE PEOPLE MOVING PEOPLE" will consult in the master planning of new short-range intra-city mass transportation systems, license Disney-developed systems for these applications, and administer their construction and installation.

DESIGNERS/BUILDERS/OWNERS/OPERATORS

Unique among companies entering the transporatation field, the Walt Disney organization has not limited itself to just one aspect of a system's development and operation--but rather is involved in all phases. The community Transportation Services division can call upon the talents of an experienced team that -- over the past 20 years--has designed, constructed, and operated wholly-owned transportation systems for Disneyland in California and Walt Disney World in Florida. The Disney organization has been recognized especially as "the innovators" in the area of people-handling: If all the major systems that move people in our parks were combined, the grand total of guests carried would exceed half-a-billion...and the total passenger miles would exceed 350 million.

THE DISNEY SYSTEMS

Two Disney designed and proven systems are especially applicable to urban transportation--the Walt Disney World Monorail System, and the WEDway PeopleMover system. At Disneyland and Walt Disney World, the vehicles on these systems have already logged more than 12 million miles.

WALT DISNEY WORLD MONORAIL SYSTEM

Most popular and widely-acclaimed of the Disney systems is the monorail at Walt Disney World. Totaling 6.7 miles of track, the system is an elevated double-loop three miles in length, with an additional 7/10th mile of spur line connecting to the "round house". There are 10 trains each comprised of five cars, with capacity of 212 seated passengers per train. The system has operated since October 1971 generating over 76 million passenger miles and over one million train miles. Of special note is the Disney staff's engineering of the pre-cast concrete beamways. There are 337 separate beams, varying in length from 80 to 110 feet and including a variety of horizontally and vertically curved sections as well as straight beams.

FUTURE LINEAR MOTOR INTRODUCTION

With its emphasis on innovation, Disney will soon introduce a new electric linear motor system---to our knowledge, the first operating system using the linear induction motor for public transportation purposes. Easily adapted for use in shopping centers and downtown areas, the totally pollution-free linear induction motor has no moving parts. Instead, it creates a magnetic field which "pushes" the vehicle along an elevated guideway. This system is now being combined into the WEDway PeopleMover system, and will be introduced at Walt Disney World during 1975. The one-mile circuit will have a capacity in excess of 3,500 passengers per hour.

MODULAR CAR CONCEPT

Community Transportation Services has developed a "modular car concept" which, we believe, will make the Disney systems extremely flexible and economical---both from a manufacturing and operating standpoint. This approach will make use of a basic set of parts, which can be assembled and combined in a variety of ways, building-block fashion. It will give Disney systems the ability to meet a wide range of capacity requirements, from six-passenger vehicles to 250 passenger trains. This technical description illustrates the concept.

Community Transportation Services
P.O. Box 40
Lake Buena Vista, Florida 32830
Phone (305) 828-3405

TECHNICAL DESCRIPTION MODULAR CAR CONCEPT

MONORAIL BACKGROUND

Since 1958, Disney has designed four generations of monorail trains for use in both Disneyland and Walt Disney World. Currently operating in Disneyland is the Mark III while Walt Disney World operates the fourth generation (referred to as the FM). These trains are for medium speed multi-stop service and are what could be described as "Disney 4/5ths scale" in size. The Mark III is partially open-air but the FM is fully air conditioned. Both trains have manually operated hinged doors. The Mark III uses some honeycomb panels while the FM is a 100% honeycomb paneled body.

MONORAIL-STRUCTURAL DESCRIPTION

The first two generations of Disney monorails were of unit construction with the body structure an integral part of the chassis frame. Mark III is a separate body attached to a chassis. This chassis in turn is composed of major sub-assemblies bolted together. The FM is a variation of Mark III using wider and longer chassis sub-assemblies. The two trains, while sharing a basic chassis, have distinctly different body structures. This is the basis for the modular car concept.

MODULAR BODY DESCRIPTION

Once the decision is made that a car body is a separate unit, and can be attached to a chassis, more flexibility in design is possible. A body can now be composed of (3) main segments; (1) midsection and (2) end sections. The midsection can be a straight section of variable length and the end sections be of various shapes while their interface is identical. The midsection is built up from individual honeycomb bonded aluminum panels riveted together at their interlocking edges. The dimensions of the various size car crossections is such that all curved panels can be produced on one autoclave tool. The length or height of an individual part is readily variable by shifting tool end stops. As long as joint interfaces remain common, panel dimensions can change without re-engineering an entire body.

MODULAR CHASSIS

The chassis is assembled from (2) end truss and (2) side truss. The side truss length is variable and the end truss is made in (2) widths to accomodate std. and mid-beam sections. The suspension and power train are identical when used on std. and mid-beam except for the load arms. Different tire sizes use slightly different load arms and end hangers. Nose truss are different for coupled trains than non-coupled trains. Skirt sections are the same on all cars. The valance panels are

metal covers which are unique to each car body series group.

CAR EQUIPMENT

Within the space provided by the side truss, many variations of specific equipment can be provided to suit individual system requirements. Power, control, and air conditioning are located in the side truss. Propulsion motors are mounted on the end truss.

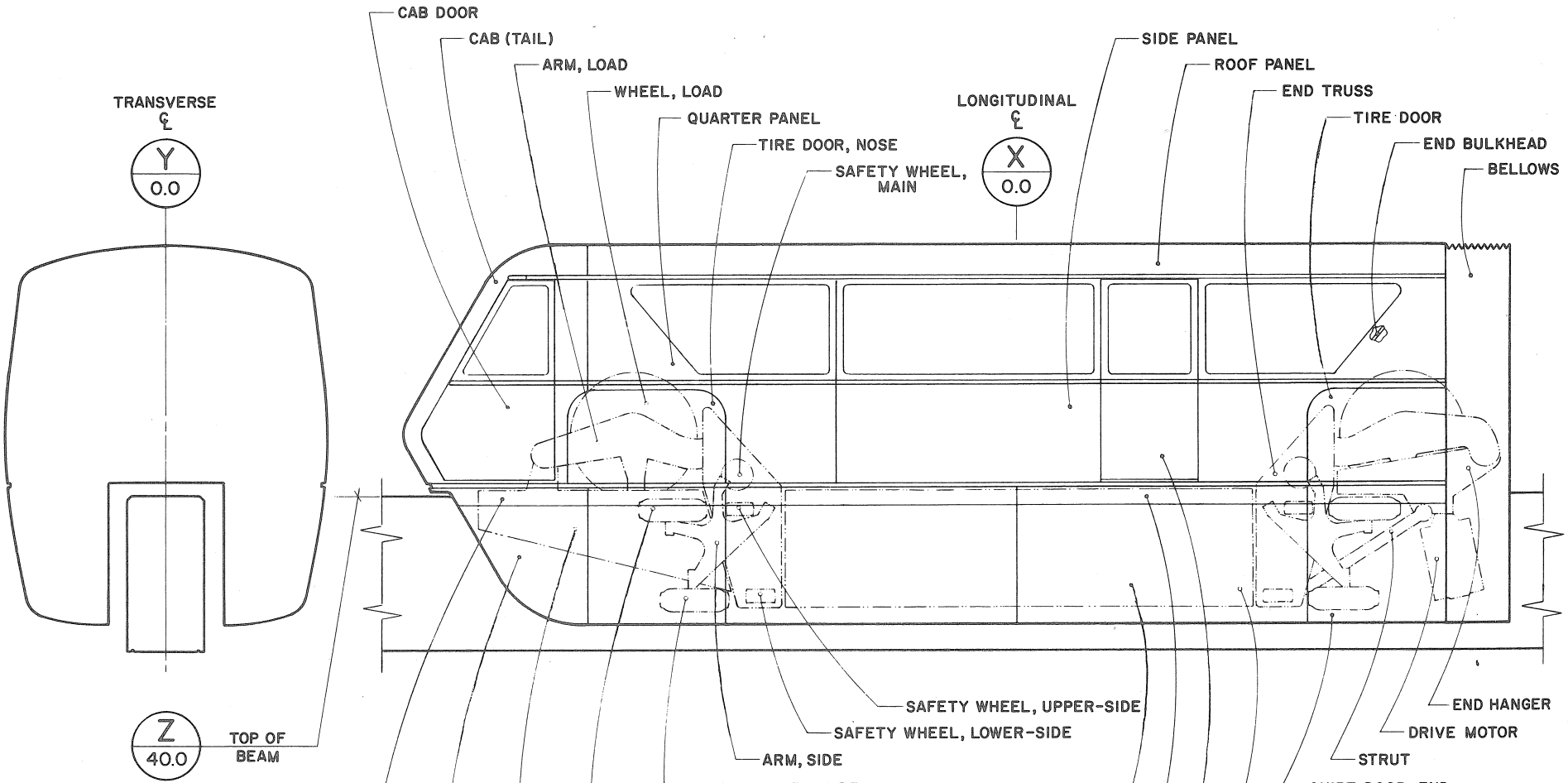
INTERIORS

Basic seat design is such that common attach points are used for both forward and side facing seats. Seat structures become a portion of the body side wall bracing with only one single floor connection. Seat pans are smoothly integrated with side wall panel covers. Air conditioning distribution is located between these covers and side wall panels. Doors are sliding flush plug type.

SURFACE TYPE CHASSIS

Although this technical description illustrates primarily monorail configurations, other chassis designs can use the same modular body concept. There are many possibilities in surface guideways. CTS can develop combinations to suit special requirements.

REVISIONS				
REV	DESCRIPTION	BY	APPR	DATE



2. DATUM PLANES CONFORM TO SAE STANDARD J128.

1. CAR CONFIGURATION SHOWN IS GENERAL ONLY.

NOTES: UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DWG

					SCALE 1/2"=1'	SHEET SIZE C	DATE	PROJECT COMMUNITY TRANSPORTATION SERVICES
		◎ CONCENTRICITY	UNLESS OTHERWISE SPECIFIED .XX ± .XXX ± ANGLES ±		DRAWN BY T. H.		5-8-74	DWG TITLE REFERENCE DATUM AND TERMINOLOGY
		≑ SYMMETRY			CHECKED BY RHGURR		5-9-74	
		✓ MACHINE SURFACE	REMOVE BURRS AND BREAK SHARP EDGES		APPROVED		5-9-74	DWG NO. CTX-2
NEXT ASSY	FINAL ASSY	⊥ PERPENDICULARITY	MACHINED FILLET RADII .015 - .030		APPROVED		5-9-74	
APPLICATION		∥ PARALLELISM	DIMENSION LIMITS HELD AFTER PLATING		APPROVED			
MATERIAL		FINISH						REV

WED ENTERPRISES imagineering
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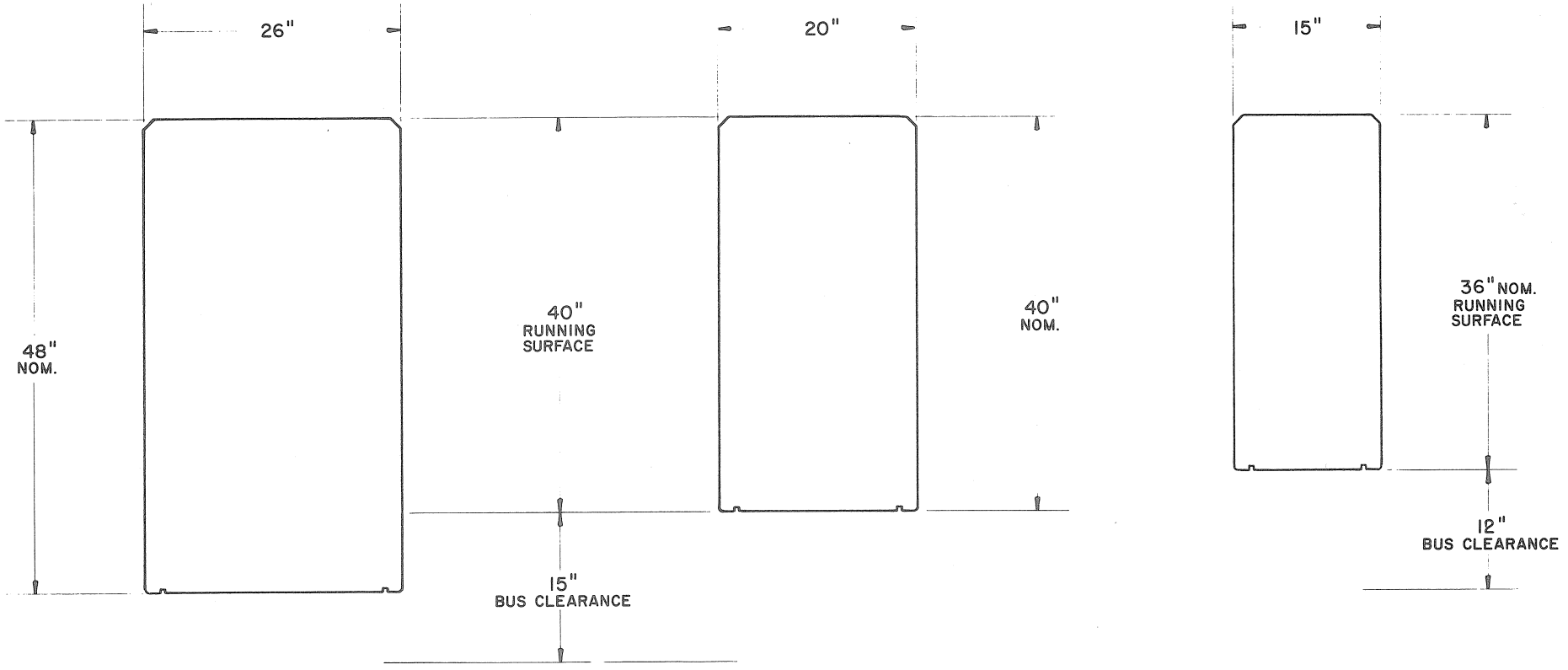
SHEET ____ OF ____

REVISIONS				
REV	DESCRIPTION	BY	APPR	DATE

STD
SERIES 900-1100

MID
SERIES 700-800

MINI
SERIES 400-600



NOTES: UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DWG

UNIT OF MEASURE	REFERENCE DESIGNATION OR NOTE	QTY PER ASSY	ITEM NO.	PART NUMBER	DESCRIPTION

SCALE 1/8" = 1" | SHEET SIZE C | DATE

PROJECT COMMUNITY TRANSPORTATION SERVICES

		◎	CONCENTRICITY	UNLESS OTHERWISE SPECIFIED	.XX ±	.XXX ±	ANGLES ±
		÷	SYMMETRY				
		✓	MACHINE SURFACE	REMOVE BURRS AND BREAK SHARP EDGES			
NEXT ASSY	FINAL ASSY	⊥	PERPENDICULARITY	MACHINED FILLET RADII .015 - .030			
APPLICATION		∥	PARALLELISM	DIMENSION LIMITS HELD AFTER PLATING			

	DRAWN BY	CHECKED BY	APPROVED	APPROVED	APPROVED
	T.H. 5-9-74	RHGURR 5-10-74	M.H. 5-10-74	R.H.Gurr 5-10-74	

DWG TITLE: BEAMWAY CROSSECTIONS

DWG NO.: CTX-3

MATERIAL

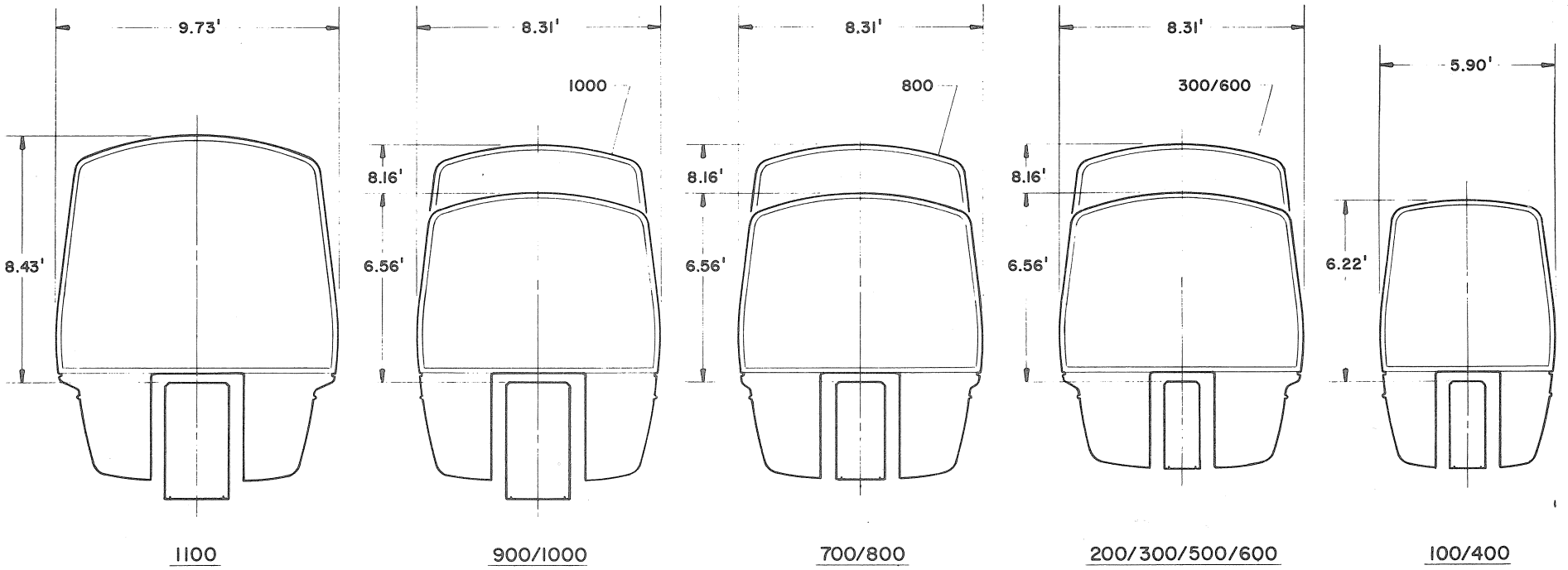
FINISH

WED ENTERPRISES
Imagineering
1401 FLOWER ST., GLENDALE, CALIF., 91201 PHONE (213) 245-8951

SHEET____ OF ____

REV

REVISIONS				
REV	DESCRIPTION	BY	APPR	DATE



1. SERIES 100/200/300 USE SURFACE TRACK (NOT SHOWN).

NOTES: UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DWG

UNIT OF MEASURE	REFERENCE DESIGNATION OR NOTE	QTY PER ASSY	ITEM NO.	PART NUMBER	DESCRIPTION

SCALE 3/8" = 1' | SHEET SIZE C | DATE

PROJECT: COMMUNITY TRANSPORTATION SERVICES

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		÷	SYMMETRY				
		⌒	MACHINE SURFACE	REMOVE BURRS AND BREAK SHARP EDGES			
NEXT ASSY	FINAL ASSY	⊥	PERPENDICULARITY	MACHINED FILLET RADII .015 - .030			
APPLICATION		∥	PARALLELISM	DIMENSION LIMITS HELD AFTER PLATING			

	DRAWN BY	CHECKED BY	APPROVED	APPROVED	
	T.H.	RH GURR			
	5-13-74	5-13-74	5-13-74	5-13-74	

DWG TITLE: BASIC MODEL SERIES CROSSECTIONS

DWG NO.: CTX-4

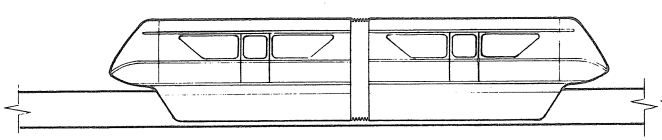
MATERIAL

FINISH

WED ENTERPRISES
imagineering
1401 FLOWER ST., GLENDALE, CALIF., 91201 PHONE (213) 245-8951

SHEET____ OF ____

REV



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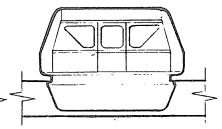

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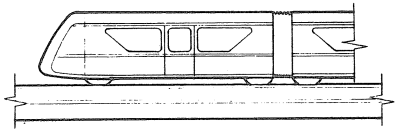

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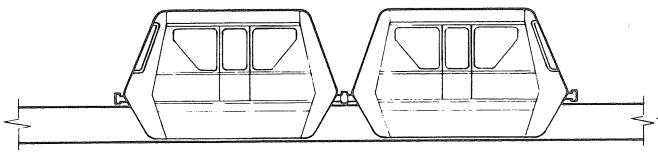

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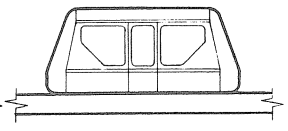

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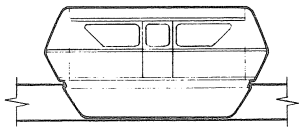

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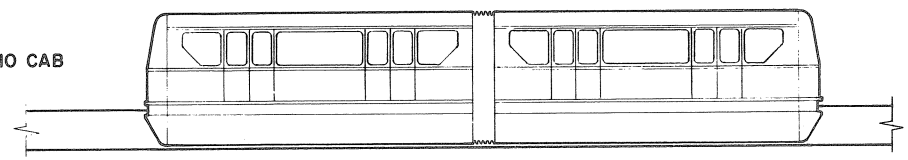

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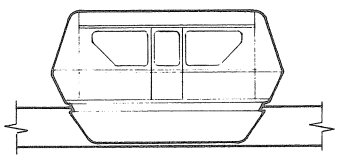

MODEL 811

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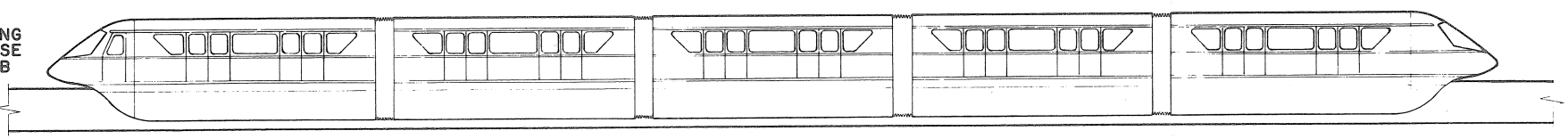
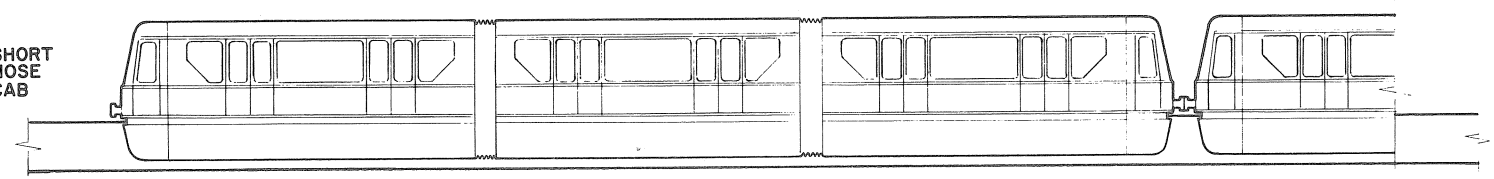


MODEL 952S

SHORT NOSE CAB



MODEL 1134DC

BASIC MODEL DESIGNATIONS

10 0 0 — BASIC TYPE

- C = COUPLING ENDS
- S = SINGLE CAB END
  D = DOUBLE CAB ENDS
  Blank = NO CAB
- No. = NUMBER OF DOORS PER CAR
- No. = NUMBER OF CARS PER UNIT*
- BASIC SERIES

* UNIT IS A TRAIN OR SINGLE CAR

SERIES	BEAM	BODY W	BODY HT
1100	STD	WIDE	HIGH
1000	STD	STD	HIGH
900	STD	STD	LOW
800	MID	STD	HIGH
700	MID	STD	LOW
600	MINI	STD	HIGH
500	MINI	STD	LOW
400	MINI	NARROW	LOW
300	**	STD	HIGH
200	**	STD	LOW
100	**	NARROW	LOW

** THIS SERIES RUN ON SURFACE TRACK

1. NOSE AND TAIL SECTIONS ARE INDIVIDUALLY VARIABLE.

NOTES: UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DWG

UNIT OF MEASURE	REFERENCE DESIGNATION OR NOTE	QTY PER ASSY	ITEM NO.	PART NUMBER	DESCRIPTION

SCALE 1/8" = 1' | SHEET SIZE C | DATE

PROJECT: COMMUNITY TRANSPORTATION SERVICES

		◎	CONCENTRICITY	UNLESS OTHERWISE SPECIFIED .XX ± .XXX ± ANGLES ±	DRAWN BY T. H.	5-20-74
		≑	SYMMETRY		CHECKED BY RHGDRR	5-20-74
		√	MACHINE SURFACE	REMOVE BURRS AND BREAK SHARP EDGES	APPROVED	5-20-74
NEXT ASSY	FINAL ASSY	⊥	PERPENDICULARITY	MACHINED FILLET RADII .015 - .030	APPROVED	5-20-74
APPLICATION		∥	PARALLELISM	DIMENSION LIMITS HELD AFTER PLATING	APPROVED	

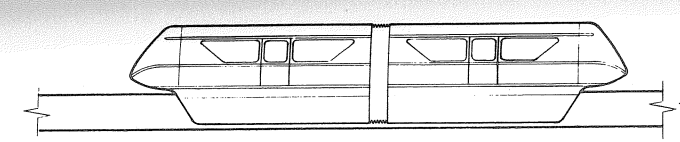
DWG TITLE: BASIC MODEL TYPICAL CONFIGURATIONS

DWG NO.: CTX-5

MATERIAL | FINISH

WED ENTERPRISES Imagineering
1401 FLOWER ST., GLENDALE, CALIF., 91201 PHONE (213) 245-8951

SHEET ____ OF ____ | REV



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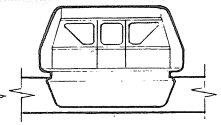

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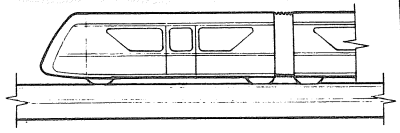

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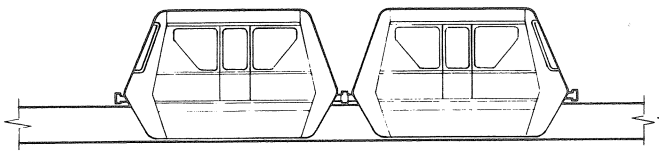

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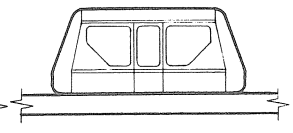
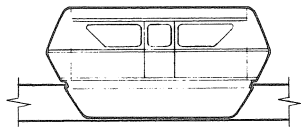


MODEL 212



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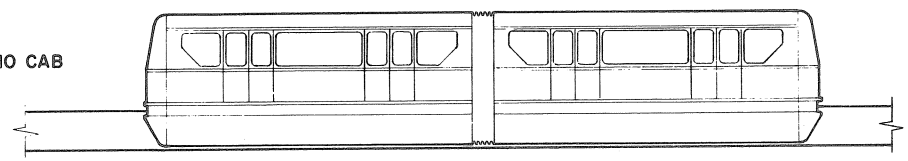
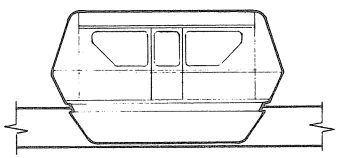
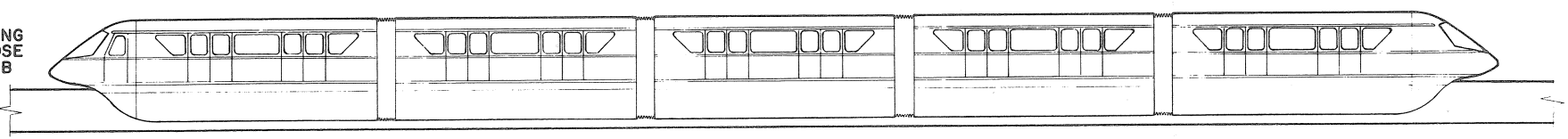


MODEL 822



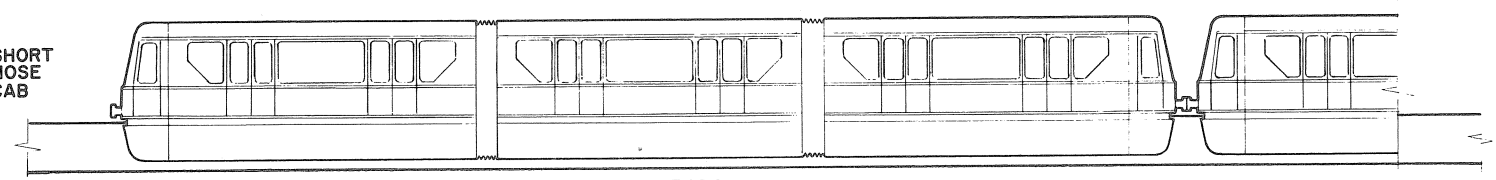
MODEL 811

LONG NOSE CAB



MODEL 952S

SHORT NOSE CAB



MODEL 1134DC

BASIC MODEL DESIGNATIONS

10 0 0 — BASIC TYPE

- C = COUPLING ENDS
- S = SINGLE CAB END
  D = DOUBLE CAB ENDS
  Blank = NO CAB
- No. = NUMBER OF DOORS PER CAR
- No. = NUMBER OF CARS PER UNIT*
- BASIC SERIES

* UNIT IS A TRAIN OR SINGLE CAR

SERIES	BEAM	BODY W	BODY HT
1100	STD	WIDE	HIGH
1000	STD	STD	HIGH
900	STD	STD	LOW
800	MID	STD	HIGH
700	MID	STD	LOW
600	MINI	STD	HIGH
500	MINI	STD	LOW
400	MINI	NARROW	LOW
300	**	STD	HIGH
200	**	STD	LOW
100	**	NARROW	LOW

** THIS SERIES RUN ON SURFACE TRACK

1. NOSE AND TAIL SECTIONS ARE INDIVIDUALLY VARIABLE.

NOTES: UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DWG

UNIT OF MEASURE	REFERENCE DESIGNATION OR NOTE	QTY PER ASSY	ITEM NO.	PART NUMBER	DESCRIPTION

SCALE 1/8" = 1' | SHEET SIZE C | DATE

PROJECT: COMMUNITY TRANSPORTATION SERVICES

DWG TITLE: BASIC MODEL TYPICAL CONFIGURATIONS

DWG NO.: CTX-5

		◎	CONCENTRICITY	UNLESS OTHERWISE SPECIFIED .XX ± .XXX ± ANGLES ±	DRAWN BY T. H. 5-20-74
		=	SYMMETRY		CHECKED BY RHGUBR 5-20-74
		√	MACHINE SURFACE	REMOVE BURRS AND BREAK SHARP EDGES	APPROVED 5-20-74
NEXT ASSY	FINAL ASSY	⊥	PERPENDICULARITY	MACHINED FILLET RADII .015 - .030	APPROVED 5-20-74
APPLICATION		∥	PARALLELISM	DIMENSION LIMITS HELD AFTER PLATING	APPROVED

MATERIAL | FINISH

WED ENTERPRISES Imagineering
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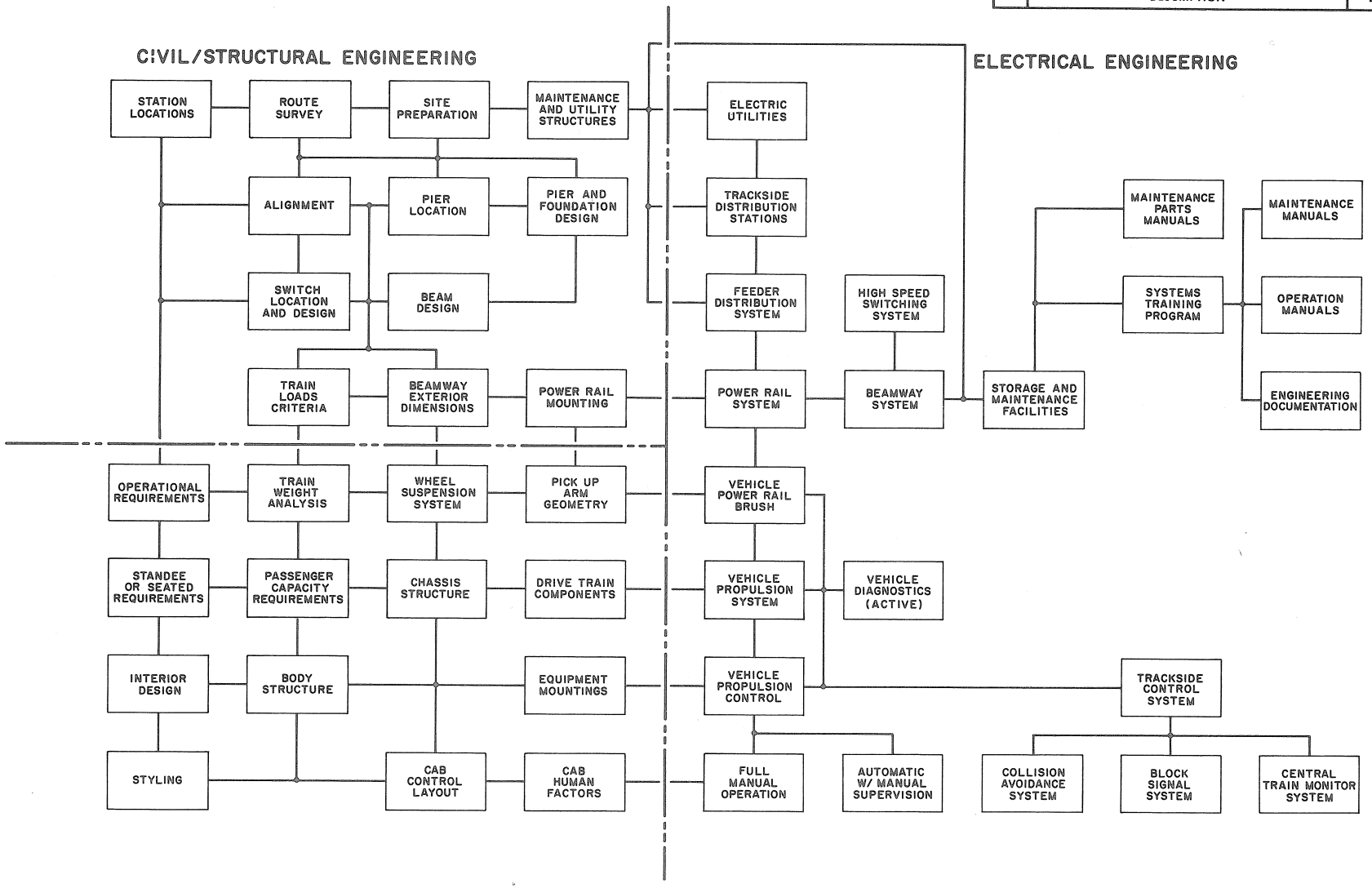
SHEET ____ OF ____ | REV

REVISIONS				
REV	DESCRIPTION	BY	APPR	DATE



NOTES: UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DWG

UNIT OF MEASURE	REFERENCE DESIGNATION OR NOTE	QTY PER ASSY	ITEM NO.	PART NUMBER	DESCRIPTION

SCALE — SHEET SIZE C — DATE

◎	CONCENTRICITY	UNLESS OTHERWISE SPECIFIED	.XX ±	.XXX ±	ANGLES ±
≑	SYMMETRY				
✓	MACHINE SURFACE	REMOVE BURRS AND BREAK SHARP EDGES			
⊥	PERPENDICULARITY	MACHINED FILLET RADII .015 - .030			
∥	PARALLELISM	DIMENSION LIMITS HELD AFTER PLATING			

	DRAWN BY	CHECKED BY	APPROVED	APPROVED	APPROVED
	T. H. 5-21-74	RHGUTR 5-29-74	5-31-74	R.M.J. 5-24-74	

NEXT ASSY — FINAL ASSY
APPLICATION
MATERIAL
FINISH

PROJECT COMMUNITY TRANSPORTATION SERVICES

DWG TITLE
ENGINEERING TASKS
INTERFACE SCHEMATIC

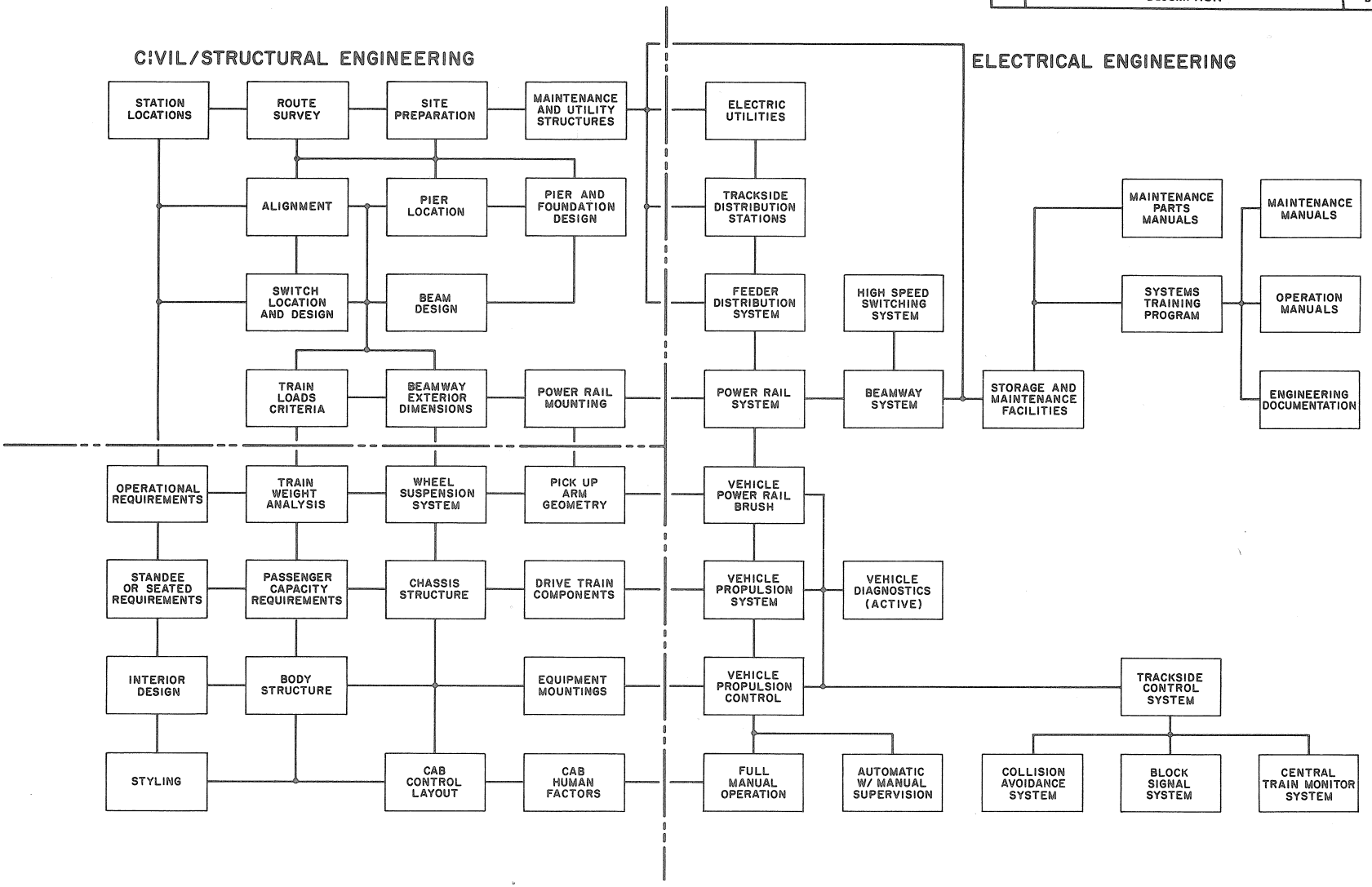
DWG NO.
CTX-6

WED ENTERPRISES
imagineering
1401 FLOWER ST., GLENDALE, CALIF., 91201 PHONE (213) 245-8951

SHEET _____ OF _____

REV

REVISIONS				
REV	DESCRIPTION	BY	APPR	DATE



NOTES: UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DWG

UNIT OF MEASURE	REFERENCE DESIGNATION OR NOTE	QTY PER ASSY	ITEM NO.	PART NUMBER	DESCRIPTION

SCALE — SHEET SIZE C — DATE

◎	CONCENTRICITY	UNLESS OTHERWISE SPECIFIED	.XX ±	.XXX ±	ANGLES ±	DRAWN BY T.H. 5-21-74
÷	SYMMETRY					CHECKED BY RHGUTR 5-24-74
✓	MACHINE SURFACE	REMOVE BURRS AND BREAK SHARP EDGES				APPROVED 5-24-74
NEXT ASSY	FINAL ASSY	⊥ PERPENDICULARITY	MACHINED FILLET RADII .015 - .030			APPROVED 5-24-74
APPLICATION		∥ PARALLELISM	DIMENSION LIMITS HELD AFTER PLATING			APPROVED

MATERIAL — FINISH

PROJECT COMMUNITY TRANSPORTATION SERVICES

DWG TITLE
ENGINEERING TASKS
INTERFACE SCHEMATIC

DWG NO. CTX-6

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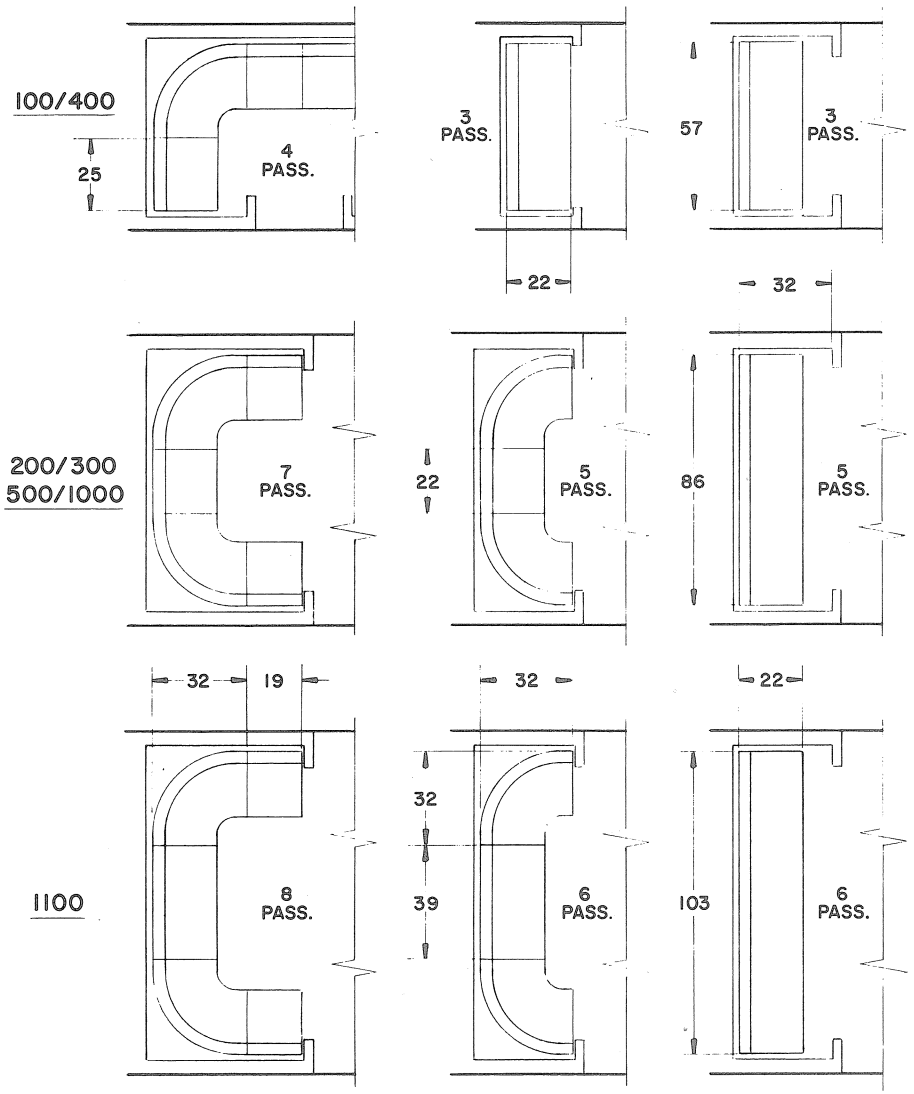
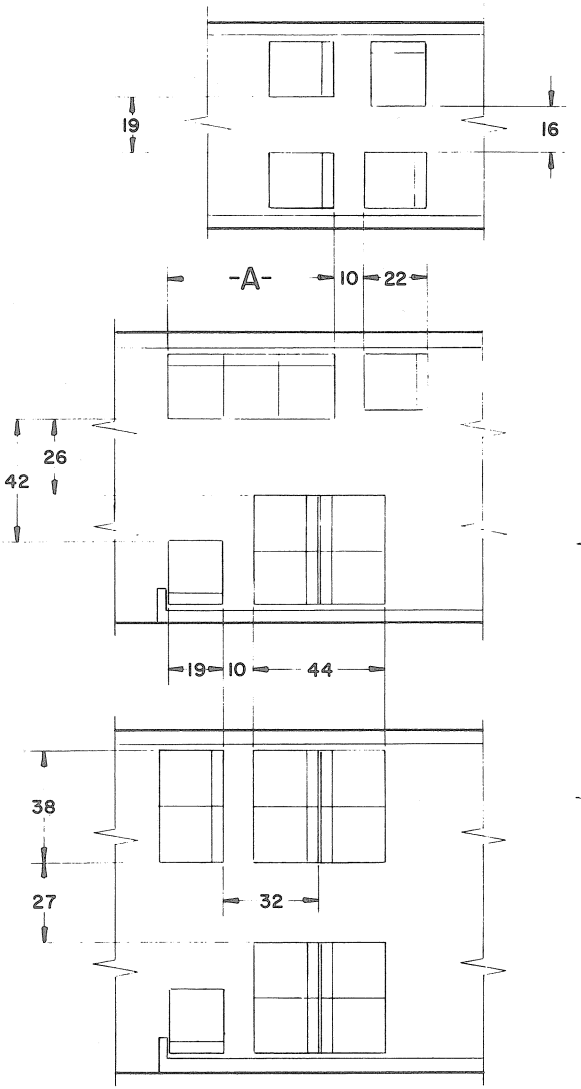
SHEET _____ OF _____ REV

REVISIONS				
REV	DESCRIPTION	BY	APPR	DATE

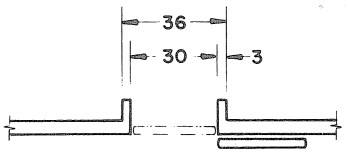
SEAT MODULES AT CAR ENDS



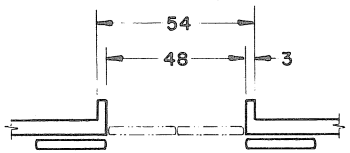
SEAT MODULES



NUMBER OF SEATS	-A- DIMENSION
1	19
2	38
3	57
4	76
5	95
6	114



SINGLE DOOR



DOUBLE DOOR

NOTES: UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DWG

UNIT OF MEASURE	REFERENCE DESIGNATION OR NOTE	QTY PER ASSY	ITEM NO.	PART NUMBER	DESCRIPTION

SCALE 3/8" = 1' | SHEET SIZE C | DATE

PROJECT: COMMUNITY TRANSPORTATIONS SERVICES

		◎	CONCENTRICITY	UNLESS OTHERWISE SPECIFIED .XX ± .XXX ± ANGLES ±	DRAWN BY T.H.	5-23-74
		≐	SYMMETRY		CHECKED BY RHGURR	5-24-74
		√	MACHINE SURFACE	REMOVE BURRS AND BREAK SHARP EDGES	APPROVED	5-23-74
NEXT ASSY	FINAL ASSY	⊥	PERPENDICULARITY	MACHINED FILLET RADII .015 - .030	APPROVED	5-24-74
APPLICATION		∥	PARALLELISM	DIMENSION LIMITS HELD AFTER PLATING	APPROVED	

DWG TITLE: BASIC MODEL SEAT AND DOOR MODULES

DWG NO.: CTX-7

MATERIAL | FINISH

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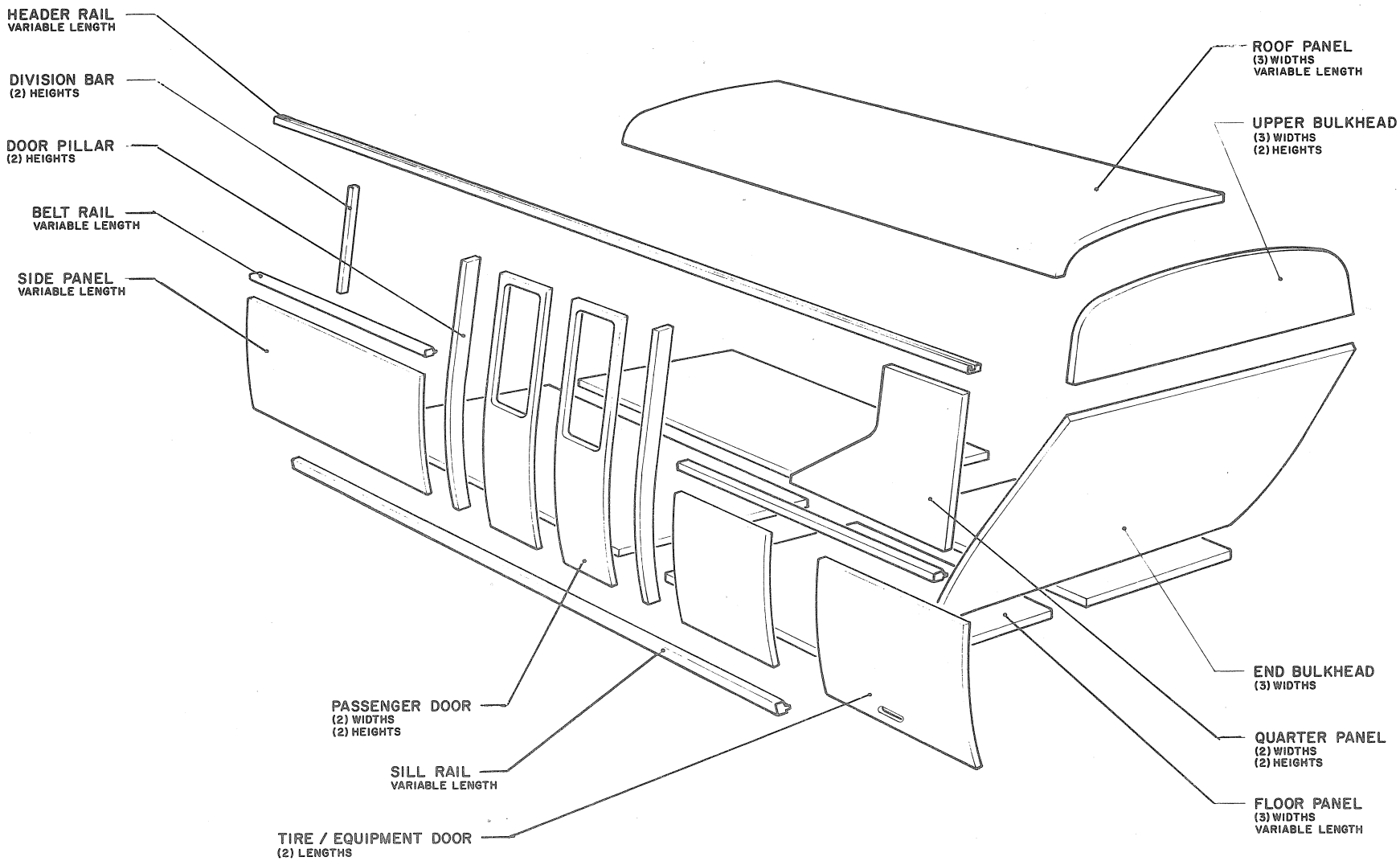
SHEET ____ OF ____ | REV

10

REVISIONS				
REV	DESCRIPTION	BY	APPR	DATE



1. ALL LARGE RADIUS CURVED PANELS ARE 120 IN. R.
   SMALL ROOF RADIUS IS 7.00 IN. R.

NOTES: UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DWG

UNIT OF MEASURE	REFERENCE DESIGNATION OR NOTE	QTY PER ASSY	ITEM NO.	PART NUMBER	DESCRIPTION

SCALE — SHEET SIZE C — DATE

PROJECT: COMMUNITY TRANSPORTATION SERVICES

		◎	CONCENTRICITY	UNLESS OTHERWISE SPECIFIED .XX ±. .XXX ±. ANGLES ±	DRAWN BY T. H.	5-27-74
		≑	SYMMETRY		CHECKED BY RH GURR	5-27-74
		✓	MACHINE SURFACE	REMOVE BURRS AND BREAK SHARP EDGES	APPROVED M. H.	5-28-74
NEXT ASSY	FINAL ASSY	⊥	PERPENDICULARITY	MACHINED FILLET RADII .015 - .030	APPROVED	5-27-74
APPLICATION		∥	PARALLELISM	DIMENSION LIMITS HELD AFTER PLATING	APPROVED	

DWG TITLE: BASIC MODEL BODY MAJOR COMPONENTS

DWG NO.: CTX-8

MATERIAL

FINISH

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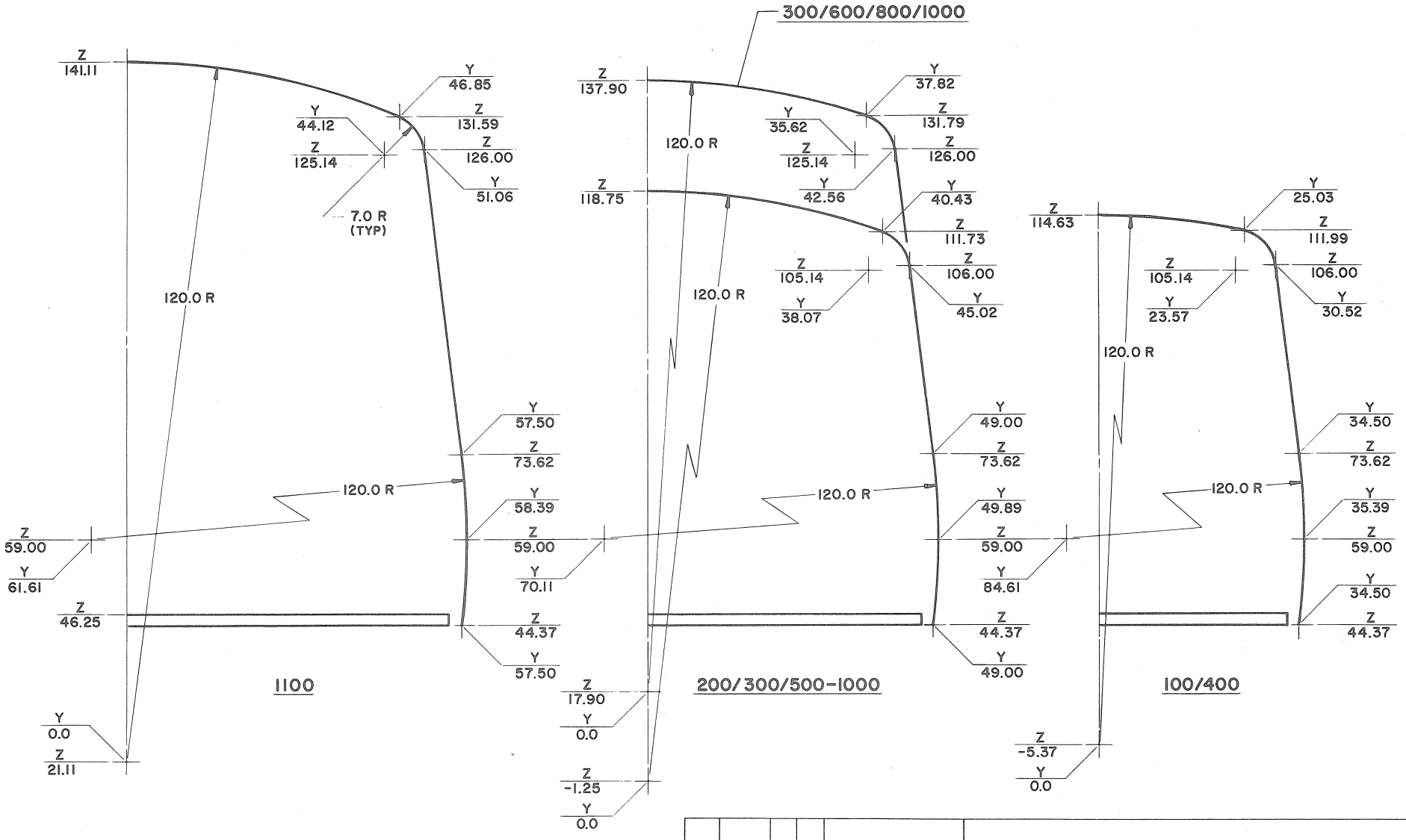
REV

10/72 DIETERICH-POST CLEARPRINT 1020

REVISIONS				
REV	DESCRIPTION	BY	APPR	DATE



NOTES: UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DWG

UNIT OF MEASURE	REFERENCE DESIGNATION OR NOTE	QTY PER ASSY	ITEM NO.	PART NUMBER	DESCRIPTION

SCALE 1" = 1' | SHEET SIZE C | DATE

PROJECT: COMMUNITY TRANSPORTATION SERVICES

DWG TITLE: BASIC MODEL CROSSECTION COORDINATES

DWG NO.: CTX-9

		◎	CONCENTRICITY	UNLESS OTHERWISE SPECIFIED	.XX ±	.XXX ±	ANGLES ±
		=	SYMMETRY				
		✓	MACHINE SURFACE	REMOVE BURRS AND BREAK SHARP EDGES			
NEXT ASSY	FINAL ASSY	⊥	PERPENDICULARITY	MACHINED FILLET RADII .015 - .030			
APPLICATION		∥	PARALLELISM	DIMENSION LIMITS HELD AFTER PLATING			

	DRAWN BY	CHECKED BY	APPROVED	APPROVED	APPROVED
	T.H. 5-30-74	RHGURR 5-31-74	5-31-74	5-31-74	

MATERIAL | FINISH

WED ENTERPRISES
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SHEET _____ OF _____ REV

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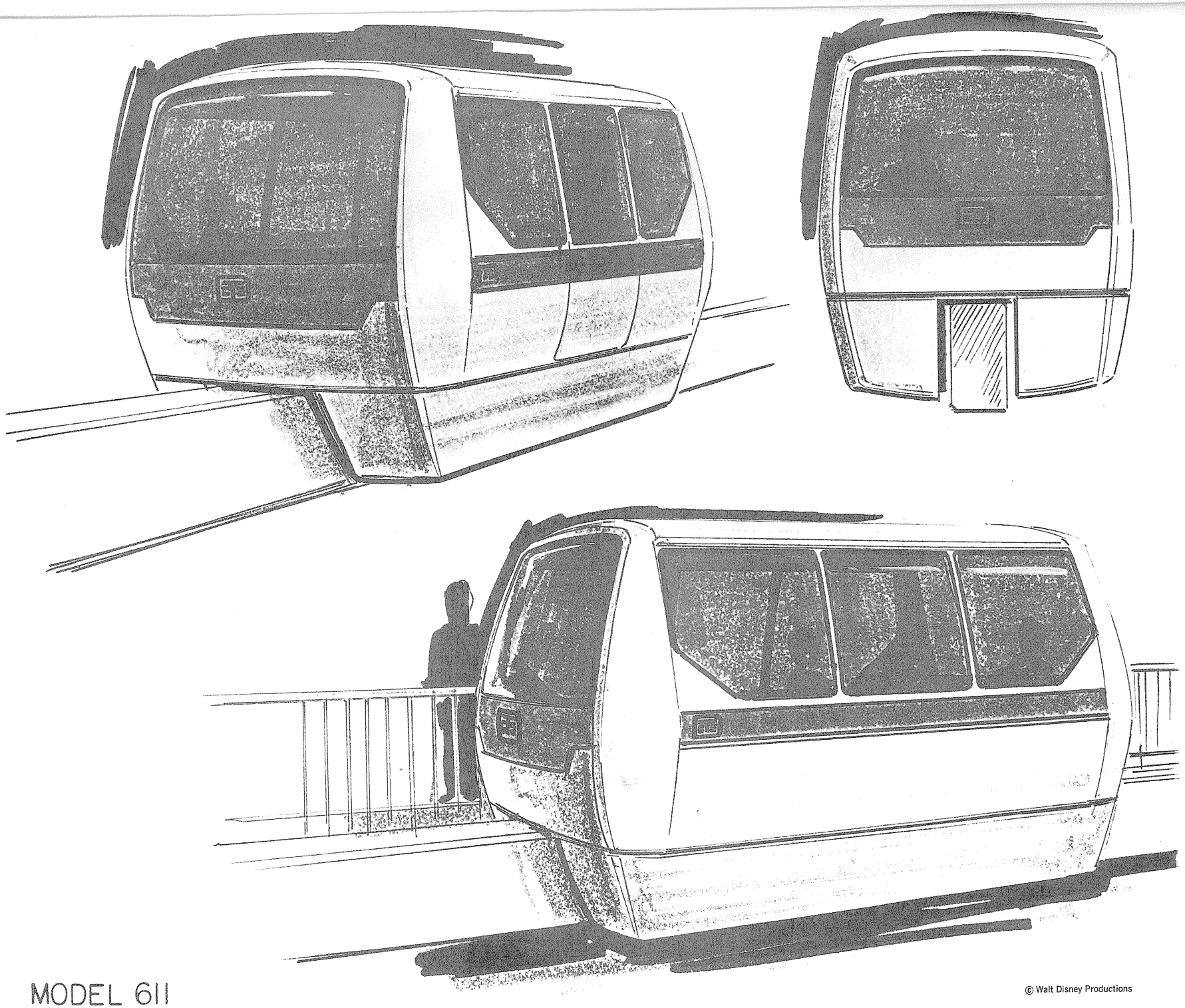
10/72 DIETERICH-POST CLEARPRINT 1020



MODEL 611